

Level III and IV Ecoregions of EPA Region 4

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for environmental resource management. Ecoregions are directly applicable to the immediate needs of state agencies, including the selection of regional stream reference sites, the development of biological criteria and water quality standards, and the establishment of management goals for nonpoint-source pollution. They are also relevant to integrated ecosystem management, an ultimate goal of many federal and state resource management agencies. This map depicts revisions and subdivisions of ecoregions, compiled originally at a relatively small scale (USEPA 2003, Omernik 1987). Compilation of this map, performed at the larger 1:250,000-scale, is part of several collaborative projects primarily between the U.S. Environmental Protection Agency (EPA) National Health and Environmental Effects Research Laboratory (NHEERL), the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), U.S. EPA Region IV, and state environmental resource agencies (Chapman et al. 2004, Griffith et al. 1994, 1998, 2001, 2002, Woods et al. 2002). Collaboration and consultation also occurred with other state and federal agencies, including the U.S. Forest Service and U.S. Geological Survey, in an effort to obtain consensus regarding alignments of ecological regions.

The approach used to compile this map is based on the premise that ecological regions can be identified through the analysis of the patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity. These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level. A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I and Level II divide the North American continent into 15 and 52 regions, respectively (Commission for Environmental Cooperation 1997). At Level III, the continental United States contains 104 regions and the conterminous U.S. has 84 ecoregions (U.S. EPA 2003). Level IV is a further subdivision of the Level III ecoregions. Explanation of the methods used to define the ecoregions are given in Griffith et al. (1994, 1997, 2001, Omernik 1995, 2000), and Gallant et al. (1989).

Regional collaborative projects such as these state efforts, where the goal is to reach consensus among resource management agencies, comprise a step in the direction of reaching the objectives of the Memorandum of Understanding for developing a common framework of ecological regions (McMahon et al. 2001). A common spatial framework would allow integrated ecosystem-type resource management across agencies having different responsibilities and interests for the same geographic areas. Reaching that objective requires recognition of the differences in the conceptual approaches and mapping methodologies that have been used to develop the most commonly used existing ecoregion-type frameworks, including those developed by the U.S. Forest Service (Bailey and others 1994), the U.S. EPA (Omernik 1987, 1995), and the NRCS (U.S. Department of Agriculture - Soil Conservation Service

1981). As each of these frameworks is further developed, the differences between them are becoming less. Collaborative projects at the state and regional level, where some agreement has been reached among multiple resource management agencies, are a step toward attaining consensus and consistency in ecoregion frameworks for the entire nation.

The purpose of this map of Level III and IV Ecoregions of EPA Region 4 is to: 1) highlight the current status and progress of ecoregion projects in the Southeast; 2) illustrate the hierarchical nature of the ecoregions; and 3) promote discussion and debate about the location of boundaries, level of consistency from state to state, and areas in need of revision. Some states, such as Florida, that had ecoregions delineated many years ago, are in need of further revisions to be consistent with more recent state projects in Region 4 and other parts of the U.S. Comments and suggestions should be addressed to Glenn Griffith, Dynamac Inc., c/o U.S. EPA, 200 SW 35th Street, Corvallis, OR 97333, (541) 754-4465, email: griffith.glen@epa.gov, or to James Omernik, USGS, c/o U.S. EPA - NHEERL, 200 SW 35th Street, Corvallis, OR 97333, (541) 754-4458, email: omernik.james@epa.gov.

Literature Cited:

- Bailey, R.G., P.E. Avers, T. King, and W.H. McNab (eds.). 1994. Ecoregions and subregions of the United States (map) (supplementary table of map unit descriptions compiled and edited by W.H. McNab, and R.G. Bailey). U.S. Department of Agriculture-Forest Service, Washington, D.C., scale 1:7,500,000.
- Chapman, S.S., G.E. Griffith, J.M. Omernik, J.A. Comstock, M.C. Beiser, and D. Johnson. 2004. Ecoregions of Mississippi. (2 sided color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.
- Commission for Environmental Cooperation. 1997. Ecological regions of North America: toward a common perspective. Commission for Environmental Cooperation, Montreal, Quebec, Canada. 71p.
- Gallant, A.L., T.R. Whittier, D.P. Larsen, J.M. Omernik, and R.M. Hughes. 1989. Regionalization as a tool for managing environmental resources. EPA/600/3-89/600. U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, OR. 152p.
- Griffith, G.E., J.M. Omernik, C.M. Rohm, and S.M. Pierson. 1994. Florida regionalization project. EPA/600/Q-95-002. U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, OR. 83p.
- Griffith, G.E., J.M. Omernik, T.F. Wilton, and S.M. Pierson. 1994. Ecoregions and subregions of Iowa: A framework for water quality assessment and management. The Journal of the Iowa Academy of Sciences 101(1):5-13.
- Griffith, G.E., J.M. Omernik, and S.H. Azevedo. 1997. Ecoregions of Tennessee. EPA/600/R-97/022. U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR. 51p.

Griffith, G.E., J.M. Omernik, and S.H. Azevedo. 1998. Ecoregions of Tennessee. (2 sided color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:940,000.

Griffith, G.E., J.M. Omernik, J.A. Comstock, and T. Foster. 2001. Ecoregions Georgia. U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR. 48p.

Griffith, G.E., J.M. Omernik, J.A. Comstock, S. Lawrence, G. Martin, A. Goddard, V.J. Hulcher, and T. Foster. 2001. Ecoregions of Alabama and Georgia. (2 sided color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:1,700,000.

Griffith, G.E., J.M. Omernik, J.A. Comstock, M.P. Shufalee, W.H. McNab, D.R. Lenat, J.B. Glover, and V.B. Shelburne. 2002. Ecoregions of North Carolina and South Carolina. (2 sided color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:1,500,000.

McMahon, G., S.M. Gregonis, S.W. Waltman, J.M. Omernik, T.D. Thorson, J.A. Freezof, A.H. Rorick, and J.E. Keys. 2001. Developing a spatial framework of common ecological regions for the conterminous United States. Environmental Management 28(3):293-316.

Omernik, J.M. 1987. Ecoregions of the conterminous United States. Map Supplement (scale 1:7,500,000). Annals of the Association of American Geographers 77(1):118-125.

Omernik, J.M. 1995. Ecoregions: A spatial framework for environmental management. In: Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. W.S. Davis and T.P. Simon (eds.), Lewis Publishers, Boca Raton, FL, pp. 49-62.

Omernik, J.M., S.S. Chapman, R.A. Lillie, and R.T. Dumke. 2000. Ecoregions of Wisconsin. Transactions of the Wisconsin Academy of Science, Arts and Letters 88(2000):77-103.

U.S. Department of Agriculture-Soil Conservation Service. 1981. Land resource regions and major land resource areas of the United States. Agriculture Handbook 296. 156 p.

U.S. Environmental Protection Agency. 2003. Level III Ecoregions of the Continental United States, Map M-1 (revision of Omernik, 1987). U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR.

Woods, A.J., J.M. Omernik, W.H. Martin, G.J. Pond, N.M. Andrews, S.M. Call, J.A. Comstock, and D.D. Taylor. 2002. Ecoregions of Kentucky. (2 sided color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

